

# PATENT SPECIFICATION

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## (54) RAPIDLY DISSOLVABLE DRY BEVERAGE MIX

(71) We, THE PROCTER & GAMBLE COMPANY, a corporation organised and existing under the laws of the State of Ohio, United States of America, of 301 East Sixth Street, Cincinnati, Ohio 45202, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a food product, more particularly a dry beverage flavour mix. Such a mix may be used in preparing a beverage by adding the flavour mix to a liquid, for example water, and dissolving the dry mix therein. These aqueous beverages may either be consumed as such, or, more typically, may be carbonated to provide sparkling, effervescent soft drinks.

The market for carbonated beverages has increased very considerably, and today this market supports an industry involving many millions of pounds in value. Up to the present, this market has been served almost exclusively by beverages which are precarbonated to the proper level for immediate consumption and then packed in bottles or cans. While carbonation of beverages at the point of consumption, such as soda fountains, has been practiced for years, preparation of point-of-consumption individual servings of carbonated beverages in the home has not thus far been widely accepted.

One method of making carbonated beverages in the home involves the dilution of flavour syrups to the proper concentration and carbonating the resulting solution, such as would be done at a soda fountain. However, such an approach is burdensome for the volume of carbonated beverages consumed in the home, involving the procurement and correct dilution of the flavour syrups, and hence has not met with widespread popularity. Another method of making carbonated beverages in the home involves the use of dry mixes containing flavours and sugars along with a gas generation system. This type of drink has

also not gained wide consumer acceptance because products marketed thus far have not afforded the consumer a quality alternative to pre-carbonated, bottled beverages.

One large disadvantage of current dry beverage mixes is the relatively slow dissolution rate of the dry mix when added to water. Conventional dry beverage mixes often take up to 5 or 10 minutes to completely dissolve, and even then, some mixes leave an unsightly residue of undissolved particles or a semi-dissolved sticky material at the bottom of the drinking vessel. Also, conventional mixes typically require mechanical agitation to achieve complete dissolution and uniform concentration throughout the beverage. As is evident from the lack of substantial market volume, compared to pre-carbonated, bottled beverages, this extra preparation time and effort for conventional dry beverage mixes is extremely disadvantageous to the consumer who turns to a carbonated beverage as a readily accessible and convenient item of cold, liquid refreshment.

The present invention assists in making possible the formation of a dry beverage mix having an extremely rapid dissolution rate upon contact with water and requiring only a minimum amount of agitation for dissolution in an aqueous solution to form a beverage in a short period of time.

The invention also assists in making it possible to furnish the consumer with a convenient method for preparing carbonated beverages equal in concentration and quality of flavour and carbonation to pre-carbonated, bottled beverages.

According to the invention a process for preparing a rapidly dissolvable dry beverage flavour mix comprises:

(a) forming a mixture of beverage flavour base and sugar such that the mixture has a weight ratio of flavour base:sugar of from 0.03:1 to 0.15:1 and a total solids content of from 75% to 95% by weight;

(b) drying the mixture to form a stable foam, and

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(c) grinding the stable foam to form discrete dry beverage flavour particles.

As used herein, the term "flavour base" is intended to cover all flavouring materials present in a beverage with the exception of the sweetening agent and any acid. While both the sweetening agent and the acid do influence markedly the flavour of a given beverage, the characteristic flavor results from the flavoring materials added. These flavoring materials come in the form of alcoholic extracts or essences, aqueous solutions and emulsions, solutions of flavors in glycerol and propylene glycol, and fruit-juice concentrates. Beverage flavor ingredients of an essential-oil character often require extraction with alcohol from the source raw material. Water-soluble flavoring components can be made as aqueous solutions. When necessary, due to the low water solubility, emulsions can be prepared or solutions in glycerol or propylene glycol can be made. Such emulsions or solutions avoid the use of alcohol. Concentrated fruit juices are used in preference to fruit juices themselves, for on dilution with water, greater fidelity of fruit flavor can be obtained. Also, as used herein, the term "sugar" is intended to be generic to cover not only sucrose, the sugar most commonly used in the production of beverages, but also includes dextrose (D-glucose), fructose (levulose), liquid sugar (either sucrose or an invert-sucrose blend), invert sugar (a 50-50 blend of dextrose and fructose), lactose or maltose.

The flavoring materials are typically used as a flavor concentrate, or "flavor base", of a given concentration. A beverage is obtained by diluting the flavor base to the proper strength for a particular beverage and incorporating the proper sugar content for that beverage. Of course, if the beverage will conventionally be mixed together in a dry mix which is then dissolved in the proper amount of water. A carbonated beverage may be obtained by adding such a dry mix to precarbonated water, or by adding the dry mix to plain water, such as tap water, and then carbonating this aqueous solution.

Formulations for various flavor bases are well known to those skilled in the art and may readily be obtained from published sources. For example, Merory, *Food Flavorings*, The Avi Publishing Co., 1960) Westport, Connecticut, U.S.A. lists various flavor base formulations in Chapter 17, entitled "Syrup and Soda Flavorings"; also in Jacobs, M.B., *Manufacture and Analysis of Carbonated Beverages*, Chemical Publishing Company, New York, N.Y., U.S.A. (1959), formulations for many fruit and non-fruit flavor bases are given. Complete flavor bases are also commercially available in standardized concentrations for ease in dilution to the proper concentration for the final beverage.

These are commonly known as "2-ounce" or "4-ounce" flavor bases depending upon the amount of the base which must be added to a gallon of simple syrup which is then diluted with water to the final beverage strength. (As those skilled in the art will appreciate, a simple syrup is a solution of sugar in water, usually in a standard concentration). Commercially obtained flavor bases are typically about 50% solvent, usually water or ethanol, with the flavoring material typical for a particular flavor dissolved therein.

In accordance with the present invention, the flavor base, containing all the flavoring materials necessary for a particular beverage, is admixed with the total sugar content required for that amount of flavor base to form a thoroughly mixed homogeneous slurry. It has been found that in order to obtain the rapidly dissolving dry mix particles of the present invention, it is necessary that the flavor base/sugar slurry have a total solids content of from 75% to 95%, by weight, and preferably, from 85% to 94%, so that the beverage mix produced from the slurry is able to be dried in the proper physical form to achieve rapid dissolution of the particles. In this regard, it is often necessary to add a small amount of water to achieve the best consistency for admixing. Only so much water as is necessary for these purposes should be added since it is important that the total solids concentration be maintained in the range as set forth above. If too much water is added to the mixture, the flavoring materials in the flavor base will separate into oil and water layers resulting in a non-uniform flavored product. At the other extreme, at moisture levels of below 5%, the necessary dispersion of flavor base and sugar does not take place.

In the practice of the present invention, it is also important that the flavor base:sugar ratio, by weights, be from 0.03:1 to 0.15:1, in order to assure the production of rapidly dissolving flavor particles. While the specific optimum ratio will vary for different flavoring systems due to the different bases and flavoring materials used, the ratio for all known flavoring systems will fall within the above range. Thus, any specific optimum ratio can easily be determined by one skilled in the art in the light of the present specification.

The flavor base/sugar mixture is blended together to provide a slurry, or "slush", before drying. It has been found that any type of conventional mixing means may be used for blending the mixture as long as a thorough mixing is achieved. It is preferred, however, that the mixing means employed does not beat into the slurry an abundance of air since such an abundance of air will cause an unstable foam during drying and correspond-